

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP2005/004412

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04B7/08 H04B1/28

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EP0-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 905 767 A (FUJIMURA ET AL) 18 May 1999 (1999-05-18) column 2, line 50 - column 3, line 33 column 21, line 65 - column 22, line 20 figures 1,50	1-3
X	US 5 579 341 A (SMITH ET AL) 26 November 1996 (1996-11-26) column 4, line 13 - column 5, line 19 column 11, lines 10-44 figures 2,5	1-3
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "A" document member of the same patent family

Date of the actual completion of the international search

6 June 2005

Date of mailing of the international search report

29. 08. 05

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>SUDO H ET AL: "OFDM TRANSMISSION DIVERSITY SCHEME FOR MMAC SYSTEMS" VTC 2000-SPRING. 2000 IEEE 51ST. VEHICULAR TECHNOLOGY CONFERENCE PROCEEDINGS. TOKYO, JAPAN, MAY 15-18, 2000, IEEE VEHICULAR TECHNOLOGY CONFERENCE, NEW YORK, NY : IEEE, US, vol. VOL. 1 OF 3. CONF. 51, 15 May 2000 (2000-05-15), pages 410-414, XP000970651 ISBN: 0-7803-5719-1 figures 2a,3a</p> <p>-----</p>	1-3

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International application No.  
PCT/JP2005/004412

### Box II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-3

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3

Independent claim 1 relates to a receiver comprising a plurality of receiver branches operable to receive signals; a plurality of sample-and-hold circuits, each of which is connected to corresponding one of said plurality of receiver branches, each of said plurality of sample-and-hold circuits being operable to extract a discrete value from an output signal from corresponding one of said plurality of receiver branches; a switch connected to said plurality of sample-and-hold circuits, said switch being operable to allow output signals from said plurality of sample-and-hold circuits to be selectively fed out of said switch at time intervals; and a demodulating unit connected to said switch, said demodulating unit being operable to demodulate data from output signals from said switch.

Claim 2 depending on claim 1 states that each of said receiver branches includes a band pass filter operable to allow corresponding one of the signals to travel through a certain band, and a first amplifier operable to amplify an output signal from said band pass filter.

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2. claim: 18

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Independent claim 18 relates to a receiver comprising a plurality of receiver branches operable to receive signals; a switch connected to said plurality of receiver branches, said switch being operable to allow output signals from said plurality of receiver branches to be selectively fed out of said switch at time intervals; a sample-and-hold circuit connected to said switch, said sample-and-hold circuit being operable to extract discrete values from output signals from said switch; a variable amplifier connected to said sample-and-hold circuit, said variable amplifier being operable to amplify output signals from said sample-and-hold circuit; a gain control unit operable to control a gain in said variable amplifier; a gain control information-detecting unit operable to detect gain control information to be fed into said gain control unit; an analog-to-digital converter connected to said variable amplifier, said analog-to-digital converter being operable to convert output signals from said variable amplifier in value from analog values to digital values; and a demodulating unit connected to said analog-to-digital converter, said demodulating unit being operable to demodulate data from output signals from said analog-to-digital converter, wherein said gain control unit executes control such that the output signals from said variable amplifier fall within a dynamic range of said analog-to-digital converter.

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### 3. claim: 19

Independent claim 19 relates to a receiver comprising a plurality of receiver branches operable to receive signals; a switch connected to said plurality of receiver branches, said switch being operable to allow output signals from said plurality of receiver branches to be selectively fed out of said switch at time intervals; a sample-and-hold circuit connected to said switch, said sample-and-hold circuit being operable to extract discrete values from output signals from said switch; an analog-to-digital converter connected to said sample-and-hold circuit, said analog-to-digital converter being operable to convert output signals from said sample-and-hold circuit in value from analog values to digital values; a demodulating unit connected to said analog-to-digital converter, said demodulating unit being operable to demodulate data from output signals from said analog-to-digital converter; a clock-generating unit operable to generate clock signals to be fed into said switch, said sample-and-hold circuit, and said analog-to-digital converter, and a clock control unit operable to control a clock frequency in said clock-generating unit.

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### 4. claims: 4-15

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claim 4 depending on claim 1 states that the receiver further comprises an analog-to-digital converter connected between said switch and said demodulating unit, said analog-to-digital converter being operable to convert the output signals from said switch in value from analog values to digital values.

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5. claims: 16, 17

Claims 16 and 17 depending on claim 1 state that a length / load of wiring extending from an input end of each of said plurality of receiver branches to each of said sample-and-hold circuits is substantially identical for each of said plurality of receiver branches.

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